5440-10 Design and Technology Education

The holder is authorized to teach design and technology education in grades 5-12.

In order to qualify for this endorsement, the candidate shall demonstrate the following:

Knowledge Standards:

Demonstrates knowledge of technology education concepts and skills delineated in current national professional standards[1] and in *Vermont's Framework of Standards and Learning Opportunities* including:

Development of Technological Thinking: Typical misconceptions or naïve ideas about technology held by early to late adolescents

*Foundations: A*pplications of design and engineering processes to the solution of problems; the evolution of technology, including the historical relationships of science, mathematics, and technology; social, economic, cultural, and political roles and responsibilities of scientists, engineers, and technologists

Technology Content Areas: Systemic understanding of the applications of technology in various areas including communications, construction, manufacturing, transportation, energy, health, and biotechnology; working knowledge of a variety of tools and machines and their proper uses and applications in designing and making solutions; properties and nature of a variety of natural and synthetic materials and their appropriate applications; processes involved in the extraction, distribution, processing, and disposal of natural resources

Outputs and Impacts: Ethical and practical issues related to control of the outputs and impacts of our expanding technological activities in sectors including: communications, construction, manufacturing, power and transportation, energy, health technology, and biotechnology

Performance Standards:

Implements an inquiry-based technology education curriculum that integrates technology education problem-solving skills with content, and enables development of the habits of mind that support technological inquiry. Specifically, the educator:

Models the skills and attitudes of technological problem solving

Designs and implements investigations and assessments that engage students in problem solving activities in which they design and construct models that demonstrate solutions to particular problems

Provides students with frequent interactions with the real world as a regular part of the technology education program

Creates opportunities for students to develop and demonstrate leadership, communication, and teamwork skills by working collaboratively to design solutions and to present and discuss them with a variety of audiences

Teaches students how to be responsible consumers of technology, including understanding the positive and negative consequences of individual and societal choices

Organizes equipment, work, and learning spaces so that technological investigations are carried out in accordance with state and national safety guidelines

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Anticipates and elicits the naïve ideas, emerging concepts, and/or misconceptions that students are likely to have prior to instruction

Models and explicitly teaches forms of technical communication, including how to read sources of technical information and how to write clear, well organized technical reports

Integrates physical, mathematical, scientific, and technological tools appropriate to students' ages and abilities in order to facilitate technological inquiry and problem solving

Conveys to students how the development of technology and technological theory and understanding is a historical process with continuous creation of new knowledge and refinement or rejection of "old" knowledge

Conveys to students the roles and responsibilities of scientists, engineers, and technologists with respect to social, economic, cultural and political systems, and provides them with opportunities to actively explore the full scope of career choices available to people in the field of technology

Demonstrates sensitivity to inequities in technology education teaching and careers by incorporating specific instructional strategies that promote equity

Additional Requirements:

An experience (paid or unpaid) applying design and engineering processes to the solution of a problem, including the manipulation of materials to make and test a prototype

[1] **e.g., *Standards for Technological Literacy* (2000, International Technology Education Association)**